

In the claims:

The following is a full listing of claims as originally filed or most recently amended. No amendments are currently presented.

1. (Canceled)
2. (Previously Presented) A method as in claim 38 including the further step of:
building said blade of said blade material outwardly from said surface in a single pass of said laser.
3. (Previously Presented) A method as in claim 38 wherein the die body surface is cylindrical and said heating step includes heating an area of said die body surface with said laser and introducing said blade material into the heated area while heating said area to completely build said blade on said cylindrical die body surface.
4. (Previously Presented) A method as in claim 38 wherein said applying step includes introducing said powder, wherein said powder comprises a carbide, into the heated area while heating said area for building said blade.
5. (Previously Presented) A method as in claim 38 wherein said machining step includes shaping said blade by electrical discharge machining.
6. (Previously Presented) A method as in claim 38 wherein said machining step includes shaping said blade by milling.

7. (Previously Presented) A method as in claim 38 wherein said machining step includes shaping said blade by grinding.
8. (Previously Presented) A method as in claim 38 including the further step of heat treating said blade.
9. (Previously Presented) A method as in claim 38 including the further step of cryogenic treatment of said blade.
10. (Previously Presented) A method as in claim 38 wherein said die body material is of less than 60 Rockwell C hardness and said applying step includes:
introducing a carbide-containing high grade material of at least about 60 Rockwell C hardness into said puddle while heating said die body material along said pattern to build up a die blade in said pattern.
11. (Previously Presented) A method as in claim 10 including heat treating said die blade after said machining to harden said die blade.
12. (Previously Presented) A method as in claim 38 wherein said applying step includes introducing cladding powder selected from the group consisting of D2 steel, CMP10V steel, CMP15V steel and a nickel based superalloy with 30-40% volume fraction of tungsten carbide.

13. (Previously Presented) A process for producing a cutting die having a metal base which carries a sharpened ridge extending along a predetermined path thereon, said ridge being of a composition distinct from said metal base, comprising the steps of;

a) scanning in an area along said path with a laser beam to heat the metal base to form a puddle, an area of said puddle being greater than an area of said metal base on which said laser beam directly impinges and simultaneously supplying powdered metal having a composition distinct from said metal base to said puddle along said predetermined path via a tube moving concurrently with and radially spaced from an axis of said laser beam so that said laser beam melts a thin layer of the metal base to form said puddle along said path and the metal powder being delivered to the base is melted in said puddle and at a surface thereof and thus forms a band of fused metal powder along said path,

b) repeating steps a) so as to heat and melt a thin layer of the previously deposited metal along with additional metal powder to form an additional layer metallurgically bonded to the first layer, and

c) repeating step b) to produce multiple layers until a ridge of metal is formed along said path, said ridge having a substantially uniform height and width, and

d) sharpening the ridge so formed to suit it for use in cutting.

14. (Previously Presented) A process according to claim 13, wherein the metal base is cylindrical, the process including rotating the base to provide one component of relative motion between said base and said laser beam.

15. (Previously Presented) A process according to claim 13, wherein after said sharpening step, said ridge is heat treated using heat from said laser beam.

16. - 24. (Canceled)

25. (Previously Presented) A method as in claim 43 including a further step of heat treating said blade after said machining step.

26. (Previously Presented) A method as in claim 43 including a further step of cryogenic treatment of said blade after said machining step.

27. - 30. (Canceled)

31. (Previously Presented) The method as in claim 38 wherein said die body is cylindrical, the method including rotating said die body to provide one component of relative motion between said die body and said laser.

32. - 37 (Canceled)

38. (Previously Presented) A method of manufacturing a cutting die, said cutting die including a die body and a cutting blade formed in a pattern and integral with said die body and extending outwardly from said die body, said method comprising steps of:

a) heating an area of said die body by scanning an area with a laser to form a puddle of melted die body material in said area in the surface of said die body along a path corresponding to said pattern, said area being greater than an area of said die body on which said laser directly impinges;

b) upon forming said puddle, applying a blade material in the form of a powder to said puddle while continuing said step of heating said die body corresponding to said path such that said powder is melted in said puddle and at a surface thereof to form a deposit comprising said blade material extending from said surface, said blade material having a hardness greater than said die body material;

c) continuing performance of steps a) and b) along the entirety of said pattern; and

d) machining at least side surfaces of said deposit comprising blade material to form said blade corresponding to said pattern and extending from said die body surface.

39. (Previously Presented) A method as recited in claim 38, wherein said deposit comprising said blade material is formed having a generally half elliptical cross-section.

40. (Previously Presented) A method as recited in claim 39, wherein said machining step forms a cross-section having substantially linear sides within said half elliptical cross-section of said deposit comprising blade material.

41. (Previously Presented) A method as recited in claim 40, wherein said cross-section having substantially linear sides approximates a trapezoid.

42. (Previously Presented) A method as recited in claim 38, including further steps of
repeating steps a), b) and c) prior to performing step d) to build up a deposit of blade material having a near net cross-sectional shape, said near net shape approximating the cross-sectional shape to be developed by step d), in multiple layers.

43. (Previously Presented) A method as recited in claim 38 wherein said pattern includes portions which intersect with other portions of said pattern.

44. (Previously Presented) A cutting die including a die body and a cutting blade formed in a pattern and integral with said die body and extending outwardly from said die body, said cutting die being formed by steps of:

a) heating an area of said die body by scanning said area with a laser to form a puddle of melted die body material in said area in the surface of said die body along a path corresponding to said pattern, said area being greater than an area of said die body on which said laser directly impinges;

b) upon forming said puddle, applying a blade material in the form of a powder to said puddle while continuing said step of heating said die body corresponding to said path such that said powder is melted in said puddle and at a surface thereof to form a substantially half elliptical deposit comprising said blade material extending from said surface, said blade material having a hardness greater than said die body material;

c) continuing performance of steps a) and b) along the entirety of said pattern; and

d) machining at least side surfaces of said deposit comprising blade material to form said blade corresponding to said pattern and extending from said die body surface.

45. (Canceled)

46. (Previously Presented) The method as in claim 38 wherein said applying step includes feeding said blade material by a feeder coaxial with a beam of said laser to heat said blade material while heating said area.

47. (Previously Presented) The cutting die as in claim 44 wherein said applying step includes feeding said blade material by a feeder coaxial with a beam of said laser to heat said blade material while heating said area.